William R Johnson Capt. USAFRes

AFM 1-4

A I R F O R C E M A N U A L

AIR DOCTRINE

AIR DEFENSE OPERATIONS

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1 APRIL 1954

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AIR FORCE MANUAL
No. 1–4

DEPARTMENT OF THE AIR FORCE
WASHINGTON, *1 April 1954*

Foreword

1. *Purpose and Scope.* This Manual provides the basis for an understanding of the manner in which the air defense of the United States is conducted. Because the Air Force is charged with the defense of the United States from air attack, and provides the major forces for the air defense system, this information will be used primarily by the Air Force. However, it is appropriate guidance for all services and agencies which participate in the air defense system.

2. *Relation to Other Manuals.* This Manual is based on fundamental Air Force doctrine for the employment of air power in functions that are mutually supporting. It is therefore related to all manuals concerning operations by air forces which are assigned other tasks and responsibilities. Air defense activities peculiar to Air Force responsibilities other than the air defense of the United States are discussed in those manuals specifically concerning such operations and forces.

3. *General Nature of Manual.* This Manual is intended as guidance for the employment of all activities for the air defense of the United States in a single cohesive organization. Specific directives for the detailed operation and administration of the air defense system will be found elsewhere in the appropriate forms.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

N. F. TWINING
Chief of Staff, United States Air Force

OFFICIAL:

K. E. THIEBAUD
Colonel, USAF
Air Adjutant General

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The provisions of this Manual correspond to the provisions of FM 1–25, 15 June 1943, which are no longer applicable to Air Force activities.

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Chapter 1

INTRODUCTION

1. The Air Threat

a. The ranges of modern military aircraft have been developed to the point where there no longer is any nation on earth whose heartland is secure from air attack by reason of distance alone. Coincident with the development of the means for intercontinental ranges in large scale air operations, revolutionary progress has been made in increasing the violence and efficiency of mass destruction weapons which are deliverable from the air.

b. For a nation such as the United States, having a highly organized industrial society and many great population centers, the implications in sudden air attack are critical. It follows that forces-in-being for defense are indispensable to national security. Of these, the Air Force provides forces and measures for air security to preserve the Nation's vital resources.

2. The Objectives of Air Defense for the United States

Under the foregoing conditions the basic objective of *all* forces-in-being is to discourage any enemy from attacking the United States. In war the primary objectives of air defense are:

a. To prevent hostile air forces from inflicting such critical damage that national survival will be jeopardized.

b. To preserve the military means for conducting sustained defensive and offensive operations by air to defeat the enemy.

c. To aid in sustaining the Nation's will to resist the enemy.

3. Interdependence of Defensive and Offensive Forces

a. A ready air defense system possesses the means to destroy attacking air forces or to reduce the effectiveness of their attacks. However, purely defensive measures have limitations which make them incapable of insuring immunity from air attack. The military policy for the security of the United States recognizes that in the event of war the air defense measures against hostile air attack will be supplemented immediately by strong air counterblows against the homeland sources of the enemy's strength. One of the primary objectives of these operations is to destroy the enemy's air capabilities at the source, before their full strength can be brought to bear directly against the United States in sustained operations. Therefore, the long range air forces which are needed to conduct a powerful strategic counteroffensive against the enemy must be available concurrently with the air defense forces at the outset of hostilities.

b. The relative importance of the responsibilities for air defense against hostile air forces which are airborne in attack, and for offensive action against the sources of enemy attack are such that neither force can be increased to the point where its requirements would have the effect of denying essential strength to the other. While offensive forces act to reduce the capability of the enemy for sustained offensive action by attacking enemy air power at the source, they do not take the place of air defense forces designed and deployed for the immediate protection of the United States. Similarly, air

defense, by destroying hostile air forces engaged in attack, aids the offensive forces in their tasks. However, air defense forces do not replace offensive air forces. In these two respects the forces are mutually supporting and operate with a singleness of purpose. The allocations for each are determined periodically at the highest level.

4. The Deterrent Effect of Air Defense

Air defense forces, in place and prepared for operations, are capable of exerting significant deterrent pressure against the enemy even before attack occurs. The capability for effective defense confronts the enemy with the immediate threat of high losses in his attacking forces. This imposes certain restrictive conditions upon the enemy and to a degree limits the courses of action that his forces can employ against the defended territory. Moreover, an air defense system in being greatly reduces the enemy's chances of achieving an initial advantage through surprise in the first attack and may cause so many complications in his operations that major failure will occur.

5. Timely Intelligence Necessary

Timely intelligence concerning the enemy's air forces which are capable of attacking the United States, and concerning the enemy's most likely actions, is requisite to effective air defense. Reliable intelligence indicating when the enemy will be capable of attack, when the forces have been moved into launching position, and when the attack has been launched would do more to increase the effectiveness of air defense than any other single measure. Such external means of alerting the air defense system would permit more time for preparatory measures. For example, forces could be brought to the highest possible degree of alertness to engage the enemy air forces; identification would be simplified; and emergency forces could be made available to augment the forces primarily assigned the air defense mission. Advance warning also would permit the long range offensive forces to disperse from their home bases and to prepare to strike the enemy. More time would be available to conduct preventive measures.

6. Responsibility for Air Defense of the United States

By agreement of the highest military authority, confirmed by Executive order, the Air Force is assigned the control and direction of air defense for the United States. The air defense commander, an Air Force officer, exercises authority by command, control, or coordination over all forces, activities, and installations that are employed in air defense for the United States.

Chapter 2

FUNCTIONS AND FORCES

Section A. FUNCTIONS

1. General

Forces for air defense exploit their capabilities to the utmost to provide security from enemy attack by air. Air defense recognizes that maximum security requires the elimination of the enemy's total power to attack by air and that it is never complete until hostile air forces—wherever they may be—cease to exist as an organized effective fighting force. Air defense performs its mission by destroying invading air vehicles, imposing tactical restrictions upon their employment, and—when attacks are delivered—minimizing their effects. The functions of air defense do not imply, however, that security from air attack is a question solely of defense. Neither do they imply that security can be dealt with altogether in terms of delimited geographical areas. Consequently air defense as herein considered, although it is essentially concerned with the defense of the United States, is concerned as well with our offensive objectives and the strategy of global conflict. The foregoing circumstances are reflected in the air defense functions, which are:

a. To participate in gained command of the air.

b. To defend areas essential to the prosecution of the war.

c. To deny freedom of action to hostile forces.

d. To destroy attacking forces.

e. To divert attacking forces.

f. To deceive attacking forces.

g. To minimize the effects of enemy attacks.

h. To participate in other action when command of the air has been achieved.

2. Command of the Air

a. A hostile nation dominating the air and possessing weapons of mass destruction could have the means at the outset of war to undertake attacks intended quickly to destroy its adversary's material strength and wreck the will of its people. The ultimate security of the United States therefore demands the ability to assume the command of the air.

b. Forces-in-being capable of achieving command of the air are capable of averting attack on the nation possessing it. It constitutes a powerful deterrent when expressed in convincing proof of a capacity and determination to oppose aggression. If war does occur, forces-in-being must be sufficient to avoid defeat in the beginning of conflict. Subsequently, as the full war strength of the nation is mobilized, command of the air is exploited to make it possible for all services to undertake conclusive operations against the enemy at the least cost in lives and effort and in circumstances most favorable to success. Command of the air is an indispensable condition of victory. In all military operations security from air attack is a primary requirement.

c. Command of the air is gained and maintained by exploiting the capabilities of total air power. The air defense system, in performing its functions, achieves effects which contribute to gaining command before and during conflict. Prior to war its ability to minimize surprise in attack and to start immediate operations to destroy invading air vehicles contributes greatly to the desired position of superiority. During conflict, command of the air is obtained

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by the destruction of the enemy's air power. Air forces as well as their capital structure and immediate supporting facilities may be destroyed in offensive operations against the enemy homeland by other air forces; deployed forces likewise may be destroyed in offensive operations; additionally hostile air forces engaged in attack are destroyed in air defense operations.

d. All of these operations are mutually supporting, for wherever and howsoever enemy air forces are destroyed—or countered so successfully that they expend effort without carrying out their mission—the conditions for command of the air are advanced. In time, major action results in a definite superiority in the air and the enemy becomes unable to offset his losses and carry out his initial plans. When command of the air is that complete, the collapse of the enemy's air power as an effective instrument of war becomes a question of time and of destruction in detail.

e. After command of the air is established, forces for air defense may participate as directed in other operations to complete the defeat of the enemy.

3. The Defense of Areas Essential to the Prosecution of War

a. In this function air defense directly supports the Government's policy of building during peacetime the types and numbers of military forces considered necessary to preserve the Nation if it is attacked. This policy accepts the assumption that if prolonged surface warfare of massed forces becomes necessary, the security for the essential production resources will be provided.

b. The Nation's strength to sustain protracted warfare is contained largely in well-defined regional concentrations of plants, supplies, transportation systems, power facilities, and skilled manpower. Certain among these regions contain resources of such critical importance that they are indispensable to the Nation's capacity and will to wage war, and therefore must be preserved. Air defense is organized, deployed, and conducted to provide the highest degree of security to these vital elements of the Nation essential to survival and for the prosecution of the war.

4. The Denial of Freedom of Action to Hostile Forces

The attacker holds the initiative in warfare. He may exercise this advantage before combat begins by planning his attack to achieve surprise, and to impose other significant difficulties upon the defense. Air defense is capable of exerting both psychological and tactical effects which can restrict or deny this freedom of action to the enemy. First, air defense could constitute such a strong threat of destruction that an enemy would be constrained to forego attacks on the most strongly defended areas, or to sacrifice surprise through delay or indecisive tactics. Secondly, air defense is capable of denying freedom of action in the air to hostile forces. There the air defense system may function to confront the hostile forces with such concentrated and flexible opposition that they are unable to carry out their attack as planned and consequently lose freedom of action at the most critical time of their operation.

5. Destruction of Attacking Forces

Successful air defense is achieved when hostile air vehicles are destroyed before they reach a point at which their munitions can be released on their objectives. However, because limitations are inherent in all air defense systems, complete destruction of enemy air attacks cannot be assured. In the performance of this function the mobility and flexibility of forces for air defense are exploited to the fullest to exercise the greatest kill capacity in providing protection for the critical areas. The effects of mass destruction weapons and munitions make an increasingly high degree of security essential.

6. The Division of Attacking Forces

Because there is no method that assures complete air defense by the destruction of all attacking air vehicles, security is sought also through additional measures short of destruction. The diversion of hostile air forces from attacks on vital resources is one such relatively limited function. However, when any activity of the air defense system causes enemy air vehicles to turn away from their objective and to retire without attacking, the function of diversion achieves successful air defense within the circumstances of the attack concerned.

7. The Deception of Attacking Forces

The purpose of this function is to mislead or confuse hostile air vehicles seeking to attack. Deception may be practiced on a national or local basis. When this function is performed successfully, it prevents identification by the enemy of vital areas or objects related thereto, withholds from him all manner of information which could be used as aids to navigation, and causes him to waste his offensive effort through gross misjudgment in his operations.

8. Minimizing the Effects of Enemy Air Attacks

This function is concerned with the noncombative activities and precautions that can be performed before and after attack occurs for the purpose of minimizing damage, casualties, and the disruption of normal endeavors. The successful performance of this function results in thorough organization, public education and cooperation in procedures, dependable air warning discipline, and the avoidance of costly alarms and work stoppages. These conditions engender confidence and bolster morale.

9. Participation in Other Action

The continuous employment of all elements of the air defense system for the duration of war solely in the air defense of the United States is unlikely. Accordingly, provisions may be made by proper authority to employ assigned air defense forces in additional capacities. When an acceptable degree of security has been obtained through command of the air, appropriate forces of the air defense system may be employed elsewhere to further hasten the conclusion of the war by engaging in other operations against the enemy.

Section B. FORCES

10. General

Air defense of the United States involves the activity of military, civil and private agencies. It includes all forces and units of the Air Force, Army, and Navy physically present within the area encompassed within the capability of the air defense system and having an air defense capability. It extends to every individual, group, and organization whose efforts might contribute to the effect of air defense or whose actions might interfere with the organization and conduct of air defense functions.

11. Forces for Air Defense

The nature of air defense operations requires that certain types of forces be utilized primarily for air defense, and such forces are so assigned. Forces of any service which are utilized primarily for other operations but which have a significant air defense capability are considered as forces for air defense when employed to augment the air defense commander's allocated capabilities. The requirements for forces of other military services for employment in the air defense system are determined by the Air Force. The types of forces for air defense are which are allocated and primarily assigned to the air defense system are its basic components. These forces, because of their exceptional suitability and specialized capabilities, perform a predominant portion of the air defense functions.

a. *Air Force.* The forces of the Air Force

b. *Navy.* Naval forces are employed in air defense in the following two categories:

(1) Navy forces allocated to the air defense system, which are predominantly those designed to extend the capabilities of the air defense system to seaward.

(2) Naval forces which are located within areas encompassed within the capability of the air defense system, which have an air defense capability, and which are available to the air defense system in accordance with directives of competent authority.

c. *Army.* Army forces which are allocated and primarily assigned for employment in air defense serve to augment the air defense capability.

d. *Civilian.* These civilian activities are in two general categories: Those activities which are primarily associated with the civil defense functions and those such as skywatchers, which are primarily associated with military opera-

tions. Civilian groups in both categories are considered equally to be forces available for air defense. They are Federal, State, and local groups which possess significant capabilities for deceptive and preventive functions, and for other functions and tasks which are more suitable and feasible to the civilian organizations than to the military.

12. Required Capabilities of Forces for Air Defense

The nature of enemy attack capabilities makes it mandatory that the forces of the air defense system possess the following capabilities:

a. *A Constantly High Degree of Readiness.* Air Defense forces must be prepared to function under unfavorable and difficult conditions imposed by the enemy in exercising the initiative in attack. They must have the capability to maintain, over a long period of time, fluctuating operations ranging from standby conditions to full alert.

b. *Speed of Action.* These forces must have the capability to alert and energize themselves. When command decisions have been made, the forces must perform their functions and tasks with exceptional speed because only a limited time will be available once the forces which the enemy has committed to attack have been detected.

c. *Endurance.* Air defense forces must be capable of sustaining their operations for all periods of time during which the enemy is capable of conducting air attacks.

d. *Day, Night, Inclement Weather, and Fair Weather Operational Capability.* Since the enemy has the option of attacking during any or all such conditions, air defense forces must be proportioned as to specialized weapons capabilities so that the total force includes the ability to operate during all these conditions.

e. *Capability for Other Operations.* The forces for air defense should have characteristics which permit them to be employed in other operations.

Chapter 3

PLANNING

1. Basis for Air Defense Planning

Air defense planning is concerned primarily with timely measures to provide protection from direct air attack for those resources—industrial, military, economic, and social—which are essential to national survival.

2. The Purpose of Air Defense Plans

The major air defense plans provide information necessary to integrate or coordinate activities and operations at all echelons of command in the air defense system. These plans may apply to periods before, during, and after conflict. On the basis of the information which they provide, all elements of the air defense system can prepare concurrently to perform a common task at a specified time.

3. Overall Responsibility

As the agency charged by proper authority with air defense, the Air Force is responsible for all planning required to develop, provide, maintain, and operate the air defense system. The Air Force also is responsible for fully and appropriately coordinating air defense plans, including coordination with other friendly air defense systems, with the view to insuring the most active participation of the neighboring systems possible under the circumstances.

4. The Planning Cycle

a. *At Highest Military Level.* There is constant change and adjustment in the circumstances with which plans are concerned. Consequently, planning is a continuous process. It is conducted in varying forms at all levels of command. The plans that are prepared at the highest military level usually are concerned with the broad aspects of strategy and with determinations of the types and numbers of forces required by the concept of strategy. It is here that the resources are allocated to air defense. This cannot be done in isolation during this vital phase of the planning operations, and the requirements of other forces must be considered. These requirements in particular include strategic and theater air operations. Keen judgment is required in this phase of the planning cycle to insure the proper distribution of the resources in terms of the total resources that can be applied to the military activity. In addition to these concepts of strategy there is prepared at major air commands a separate series of more detailed plans concerned with action in support of the overall air plan. The plan for the air defense of the United States is prepared at this level.

(1) *National Security Planning.* In one phase of national security planning at governmental level the nature and extent of the military threats to the vital resources of the United States are appraised. Military, governmental, and civil agencies participate in this work as appropriate. These considerations include analyses and studies which define the resources that are indispensable to the Nation and which therefore must be preserved. Within the context of these considerations a vital resource might fall in any field of national organization and endeavor, such as the Armed Forces, the Nation's industrial capacity, raw materials, the governmental organizations for control and direction of effort, the morale of the population, skilled manpower, transportation routes and food supplies. After the vital resources have been defined, the participants in this high-level planning enumerate, weigh, and analyze the circumstances concerning the essentiality of each of the resources and the particular factors involved in providing security for each of them.

These considerations, in general, pertain to—

(a) *Susceptibility to Attack.* These considerations are concerned largely with the geographic distribution of the vital resources, including the characteristics of their concentration within certain areas, or, conversely, their dispersion. These considerations concern fixed circumstances such as distance, density, topography, and features of identification, which together or separately mark some areas, localities, and objectives as more susceptible to attack than others.

(b) *Vulnerability to Attack.* With respect to the vital resources, the considerations of vulnerability determine as completely as possible which among the resources are inherently best able to withstand destruction or neutralization from the air, and which are least able.

(c) *Enemy Capabilities.* These considerations include estimates of the capabilities of hostile governments to conduct air attacks against the vital resources, or any segment thereof. These estimates are based on intelligence information bearing on what it is possible for the hostile governments to do and what it is likely that they will do. The considerations apply to the current time and also to specified periods in the future.

(d) *Impact.* These considerations include all of the calculations necessary to determine the effects—immediate and cumulative—that the loss of any of the vital resources would have on the ability of the United States to defend itself against attack and to wage conclusive warfare.

(2) *Priorities.* As one result of this Government-level planning the vital resources are accorded relative priorities for defense against air attack. These priorities are expressed in the national objectives for security and thus become major guidance for the preparation of Air Force plans for air defense. These priorities are translated into requirements for the defense of the areas which the designated priorities involve.

b. *U. S. Air Force Planning.* At the highest level of the Air Force a concept of air strategy is prepared to determine the numbers and types of forces that the Air Force must have and how they will be employed most effectively in support of the national policy for security. In broad outline form this plan specifies the peacetime preparedness tasks for all major air commands, and, in the same outline form, the wartime tasks for each major air command if conflict occurs. It also specifies by numbers and types the forces currently available, and those which are expected to be available in the future, for accomplishing the tasks. With this basic information each major air command proceeds with its own plans. In the case of air defense the Air Force, as the responsible agency, informs the other services through appropriate channels of the quantities and types of forces required of them for the air defense system.

c. *The Air Defense Plan.* Authority to prepare a plan for the air defense of the United States is delegated to the Air Force officer who commands the air defense system. He refers to the Air Force plan for the basic information that is required. The air defense plan is prepared to inform all military services and appropriate Government and civil agencies of the deployment and employment of forces to defend the United States against air attack, and to provide guidance for subordinate command levels in the air defense system. It defines the air defense mission, enumerates available forces by types and numbers, outlines logistical support, and describes the general scheme of operations. All appropriate elements of the air defense system can refer to information from the air defense plan and make their own detailed plans and preparations to carry out their specific portions of the operations.

d. *Subordinate Air Defense Plans.* At each subordinate level of command separate plans are prepared for specific tasks that those echelons will undertake in support of the overall air defense plan. This planning pertains to tactical action, materiel and supply procedures, base facilities, communications, personnel, training programs, and other matters necessary to the air defense operations in the area of responsibility concerned. Air Force commanders of air defense forces at all organizational levels of the air defense system are held accountable for the air defense planning conducted by all component military forces in their assigned areas of responsibility. They are responsible also for maintaining coordination as required with civil agencies in their areas which conduct planning for organized air defense activities.

These associated planning activities gather all the air defense activities into an integrated scheme thus providing the most efficient use of those resources.

5. Types of Plans

Air defense plans are keyed to specific dates. The key date in such a plan is that upon which, for planning purposes, it is assumed that the United States will be attacked. There are two types of plans. They may be described very broadly as capability or emergency plans, and as programs or requirements plans. In emergency planning it is assumed that conflict may begin at once. These plans therefore are concerned with the most effective employment of the forces immediately available in the initial phases of war. In the other plans, keyed to dates in the future, the periods covered in the planning extend beyond the initial phase of conflict, and include the period of build-up through increased industrial effort, and the strategy for the later phases of warfare. These plans, taking full advantage of information gathered in operational experience, set up requirements for forces, the training and preparation of forces, and the procedures and structure to support the forces. The program planners, by working back to the present from the assumed D-day in such a plan, can determine the actions that must be taken at certain times during the intervening period in order to have the forces ready on the assumed D-day specified in the plan. In the higher levels these actions are concerned primarily with procurement schedules. At the operational levels they are concerned primarily with the utilization of the forces and equipment which are to be supplied by the procurement schedules. Accordingly, when an overall plan schedules the procurement of equipment of a new type during a specified period, the planners in the units which are to use that type of equipment make plans of their own for all of the activities necessary for their units to incorporate the new equipment into their own operations as it is received.

6. Major Factors in Providing Air Defense Forces

Two factors primarily determine the extent, composition, and overall capabilities of the air defense system.

a. The first of these factors is the vastness of the United States and the unequal extent of its development. Because of the great expanse of territory and the unequal distribution of its resources, the deployment of air defense forces equally to all parts of the Nation is not feasible. The costs of such an effort in money, manpower, and materials would be prohibitive. Planning, therefore, employs the principle of providing the most immediate defense for the most essential areas.

b. The second factor concerns the relative priorities of the other forces. Because of the vast amounts of critical materials, the costs, and the industrial effort involved in the production of forces of all kinds, it is necessary for the resources that are allocated to any one of them to be considered by the national defense authorities in relation to the essentialness of the requirements for other forces, and to maintain a desired strategic balance by controlling budgetary allocations as necessary.

7. Sources of Air Defense Forces

The most effective solution of the air defense problem lies in the inherent and organic capabilities of the Air Force to counter enemy air attacks against the United States. Because of these capabilities Air Force forces comprise the major elements of the air defense system. The concept for air defense of the United States may require the utilization of other types of forces than Air Force forces. Where such forces are to be utilized, they are provided by the services concerned, based on Air Force determination.

8. Principle Governing the Deployment of Forces

The avenues of approach that hostile forces will employ in attacking a vital area cannot be predetermined. However, it holds true in all cases that in order to attack a vital area, an enemy must arrive over a weapon release line for the area concerned regardless of his direction of approach. Accordingly, it is logical to deploy air defense forces around these areas to meet an enemy approaching from any direction. This deployment denies the enemy the unopposed ability to circumvent the defenses or to employ a choice of action in attack. This deployment also affords the opportunity to in-

tercept enemy forces at the greatest practicable distance and keep them under constant attack for the maximum time. This optimizes the various combat capabilities of all the air defense forces. Of this group, those which are deployed most distant are those which perform the surveillance functions. All other forces depend upon initial warning and continuous knowledge of the enemy's locations.

9. Command Arrangements

All air defense plans recognize the principle that the entire air defense capability is commanded at a single source and is centrally controlled for the integration of the overall plan and strategy, and that the authority for the execution of air defense functions is decentralized as appropriate to subordinate commands or agencies of the air defense system.

Chapter 4

COMMAND AND ORGANIZATION

1. Relationships for Command, Control, and Coordination

a. *General.* The responsibility for the air defense of the United States is one of the primary combat functions assigned the Air Force. By authorization of the highest civil authority, a command within the Air Force conducts the air defense and controls the efforts of all forces engaged in the air defense mission. To operate the air defense system as a single cohesive body, a single commander is designated to discharge the air defense function. The commander of the air defense system is a United States Air Force officer, and is referred to as the Air Defense Commander. At each level of command within the air defense system, an Air Force officer exercises similar command prerogative. This authority does not necessitate organizational or administrative command over all forces involved.

b. *Full Command and Control.* The Air Defense Commander exercises full command and control of all Air Force forces which are allocated and primarily assigned to the air defense system.

c. *Operational Control.* The Air Defense Commander exercises operational control over all other military forces employed in the air defense system. There are no exceptions. Operational control comprises those functions of command involving the assignment of air defense tasks and the authoritative direction necessary to accomplish the air defense mission. Specifically, operational control provides the air defense commander with authority for determining the rules of engagement of all weapons utilized in the air defense system, irrespective of the force to which assigned. It is exercised by the commanders of the Air Force organizations at the various levels which are established for control of all forces involved. This authority includes guidance toward requirements for unit training for all types of forces engaged in air defense.

(1) For forces of other services, which are provided primarily as a part of the air defense system, operational control includes authority to determine the deployment and redeployment of those forces in accordance with the mission assigned to the air defense commander.

(2) For forces of other services, which are not provided primarily as a part of the air defense system, but which have an air defense capability and may, on occasion, be allocated to the air defense system, operational control includes authority to deploy such forces only when authorized by higher authority.

d. *Control and Coordination of Civilian Groups.* During all air defense operations the air defense commanders exercise control over the efforts of all civilian agencies whose activities augment the air defense system. Included is the necessary degree of control over the activities of the civilian agency which controls air traffic. The efforts of all other civilian groups are merged into the system through coordination between the appropriate civilian authorities and the air defense commanders. In all instances the integrity of the civilian groups is maintained.

e. *Coordination With Friendly Systems.* The air defense functions are coordinated with the functions of friendly systems adjacent to or supporting the United States air defense system, in accordance with governmental policies.

2. Organization of Air Defense Forces

a. *Command Organizations.* The Air Defense Commander is responsible for establishing a command organization which will accomplish the air defense objectives and mission. For this purpose the Air Defense Commander's area of responsibility is divided into regions, the regions into sectors, and the sectors into subsectors. This manner of organization provides for the immediate control of air defense measures and forces. The organization at each command level is a miniature of the centralized control exemplified in the highest air defense command. The air defense commander in each instance is an Air Force officer. The geographical subdivisions of this system reflect the translation of vital resources into geographical localities. The target criteria primarily determine the location and relative importance of the geographical areas. The Air Force alone provides the mobility and flexibility necessary to make this organization feasible. The available Air Force forces, under this organization, can be concentrated quickly at the points of greatest need to provide the most immediate defense for the areas that are most essential.

b. *Nature of the Organizational Structure.* The organizational structure required in the air defense system includes the following characteristics:

(1) *Self-sufficiency.* One of the predominant characteristics of the air defense system is its ability to sustain itself, to alert itself if necessary, and to operate as a single, cohesive unit.

(2) *Decentralization of Execution and Delegation of Authority.* In a nation as vast as the United States it is impracticable to attempt direct control and coordination of air defense force efforts from a single location. Accordingly, execution is decentralized and authority delegated to subordinate air defense commanders in smaller geographical areas. There the level for direct control and coordination of effort is placed low enough to permit immediate decisions to be made for the employment of air defense forces, but high enough to insure the maximum utilization of the forces available. Normally, such decisions are made at the level where knowledge of the air situation in the area concerned is most pertinent, accurate, and readily available.

(3) *Rapid Shifting of Control.* Enemy air forces engaged in attack may move rapidly from one geographical area into another. Maximum effectiveness of the air defense system is achieved under these circumstances when its forces are employed continuously against the enemy. Consequently the organization incorporates the ability to shift the control of forces rapidly from one area to another as necessary.

(4) *Coordination of Air Defense Force Efforts.* Optimum effectiveness against enemy attack requires the most precise coordination of the efforts of military and civilian elements of the air defense system. Toward the same end, coordination with friendly national systems is conducted in accordance with governmental policies to permit mutual support and the exchange of essential information.

(5) *Flexibility.* In addition to the ability to control indigenous forces, the Air Force organizational structure has the inherent flexibility necessary to insure the use of all military forces which are not primarily assigned for air defense of the Nation but which may be available. The organizational structure is capable of controlling these additional forces with minimum delay and the least confusion when the employment of such forces is necessary.

(6) *Other Features.* The organization provides a proper number of operational headquarters. These serve as the focal centers from which control of force efforts is exercised and through which coordination is effected. These operational headquarters are the locations where pertinent information on which to base decisions for the employment of forces is available. The air defense organization also is characterized by a communications system for the prompt and dependable transmission of information, intelligence, and orders. Throughout the air defense system commonly understood procedures, emanating from the air defense commander, are employed.

Chapter 5

TRAINING

1. Training Objective

The objective of air defense training is to develop and perfect the skills and proficiencies which the personnel and organizations require for the effective operation of the air defense system under all conditions. Because of the potentially decisive nature of initial air attack, the air defense system must be trained for a high degree of initial performance. The air defense training objective is achieved through:

a. Individual training.
b. Unit training.
c. Systems training.
d. Joint training.
e. Combined training.
f. Maneuvers and exercises.

2. Development of Capabilities

The extent and nature of the tasks which air defense forces can perform are determined largely by the adequacy and suitability of the equipment and facilities available to them; the effectiveness of the system in operation is determined largely by the efficiency of the individuals and units associated in the functions. Proper training contributes greatly to this efficiency and therefore aids in the development of air defense capabilities. Capabilities should be developed to include:

a. Rapid action.
b. Endurance.
c. Day and night operational capability in good and bad weather.
d. Operations against the attacking enemy air forces irrespective of their tactics, techniques, and procedures.

3. Timing of Training

The timing of training is vitally important because of the possibility that the enemy will employ his greatest air capability initially in an effort to win a quick decision. Therefore, the training that insures proficiency in the performance of the air defense system from the outset must be conducted prior to the enemy's attack. Post-attack training will develop the skills which the actual operation may disclose as deficient. These training requirements will continue to exist until such time as automatic devices are developed to replace trained operators in tasks requiring special skills. Even then training requirements will continue for the necessary logistic support tasks. These considerations apply to the field of warning, detection and surveillance, identification, control and guidance for the purpose of interception, and destruction of enemy air vehicles.

4. Requirements To Be Met Through Training

a. When the personnel and organizations have attained an acceptable degree of proficiency, training is continued to maintain the standard of performance. Both phases of the training must be continuous. With the addition of new equipment and facilities to the air defense system, training must be conducted to insure that the newer capabilities are fully utilized.

b. Individual training includes consideration of the principles of application of forces in air defense. It places emphasis on the development of the ability to make sound decisions for the employment of the forces for air defense.

c. Speed of action and accuracy of action are emphasized in the standards of proficiency. Proficiency in integrated operation is advanced through maneuvers and exercises, and through systems training which employs the systems or segments thereof as a unit.

5. Responsibilities for Training

The Air Force has the responsibility of training Air Force personnel and units utilized for air defense, and accordingly, determines their individual and unit training standards. The latter constitute a broad and general governing directive for training and provide a guide for inspection. Training directives of a more detailed nature are provided at lower levels of air defense organizations. The Air Force also furnishes guidance for the air defense unit training requirements for other forces which are employed in the air defense system or which may participate in coordinated air defense activities. All cross-training—joint or combined—will be in accordance with mutually approved procedures.

6. Joint Training

The Air Force is primarily responsible for preparing and conducting training for air defense involving other participating services. Such training is planned by the appropriate air defense commanders and is conducted as agreed upon by all of the service organizational commanders concerned. This training also provides for the participation of civilian groups concerned with air defense.

7. Combined Training

The Air Force is responsible for planning combined air defense training for the air defense of the United States. This training is planned and conducted in accordance with agreements made between the air defense commander and the appropriate commanders of such other national forces as may be involved.

Chapter 6

OPERATIONS

1. General

a. Air defense reaches its planned form in the readiness of its forces to conduct coordinated operations against enemy attackers. The cumulative result of the provisions and plans of air defense is the ability to conduct air defense operations where and when necessary. Thus, forces-in-being for air defense are translated into a capability for action which exerts a strong deterrent force against attack and presents a constant threat which tends to limit the attacker's traditional freedom of choice.

b. Maximum effectiveness of the forces-in-being depends upon two indispensable conditions. The first of these is the possession of timely and accurate intelligence information indicating the enemy's capabilities, possible courses of action, and significant movements of his air forces. The second condition is the ability of the air defense system to take prompt action based on the information that is available from intelligence sources and from the facilities of the system itself.

2. Types of Operations for Air Defense

These operations are combative, deceptive, and preventive.

a. *Combative.* Precise coordination of many activities is necessary in these operations. Pre-attack intelligence information on the enemy's movements is vitally needed. Early warning and concurrent intelligence also is necessary. A sensitive communications system must be provided to move information rapidly to the points where it will be needed most urgently. The system must be organized for immediate decisions and for rapid action after the decisions have been made. The proper disposition of available forces is of dominant consideration so that maximum forces may be brought to bear against the attacker.

b. *Deceptive.* These operations supplement combative operations. By employing various techniques and devices in coordination with combative operations they have the capabilities to confuse attacking forces and to cause them to make gross errors. As in the case of the combative functions, the implementatien of deceptive operations depends upon pre-attack information of the enemy.

c. *Preventive.* These operations combine the coordinated efforts of military and civilian agencies in preparations and techniques to reduce the susceptibility of areas and resources to damage from air attack, and also to facilitate rapid recovery from attack. Interrelated communications, continuing coordination, and a control organization responsive to both civilian and military agencies are required.

3. Procedures and Methods of Air Operations

a. *Combative Operations.* Normally, combative operations are performed in four successive steps: Detection, identification, interception, and destruction.

(1) *Detection Operations.* Detection operations are conducted to supply information on which to base decisions to conduct timely action against any invading vehicles, to alert the parent and other defense systems and to provide for the issuance of air defense warnings and the execution of other measures. The information obtained through detection should be displayed simultaneously to the appropriate air defense commanders and concurrently with the

event to which it relates. Whenever possible, detection means should provide overlapping coverage. Detection operations are put in motion on the basis of information supplied by intelligence sources, other external means of alerting, and by the air defense system. The essential components of detection operations are early warning and long range stations capable of continuous surveillance, gap filling stations, an organized corps of ground observers, and an integrated communications and display system. Detection operations combine the capabilities of all available means. The means are—

(a) *Radar*, which is the basic means of detection. It is conducted from surface or airborne bases as circumstances dictate. Airborne detection operations increase the flexibility of the system.

(b) *Passive detection*, which is the detection of enemy electronic or other emissions.

(c) *Visual detection*, which employs ground observers to obtain the detection coverage when such is not obtainable from other means.

(2) *Identification Operations.* These are concerned with identification by various methods of all air vehicles penetrating or using the air space over defended areas. All identification involves one or more of the three basic means that follow.

(a) *Automatic identification devices*, which identify air vehicles in flight, usually simultaneously with detection. They eliminate the complicated manual procedures involved in other means of identification.

(b) *Correlation*, which is the matching of the position and manner of operation of detected air vehicles with reliable flight plan data.

(c) *Visual inspection*, which is the placing of the aircraft to be identified under visual surveillance of responsible identification authority through interception, grounding, and/or visual cognizance of airborne air vehicles from the ground.

(3) *Interception Operations.* Normally, these operations are conducted in planned sequence after detection and identification. This operation is the control and guidance of the interception weapon to a point from which it can complete an attack on the intercepted air vehicle. Decisions to conduct intercept operations are made at the operational level where the knowledge of the air situation in the area concerned is most pertinent, accurate, and readily available. Air traffic should be controlled during this operation so that it does not complicate interception. Recovery of the friendly interceptor after the success or failure of the intercept mission is a part of the operation. Interception is accomplished by directing the intercept weapon into action through command communication channels, providing necessary guidance to the desired point by accepted methods and monitoring its engagement and recovery.

(4) *Destruction.* Destruction of attacking enemy forces is the objective end of the combative air defense operations and is accomplished with the weapons available to the system. Following determination of hostility, the decision to destroy activates a sequence of events which thereafter take place so rapidly as to be practically automatic and concurrent. Within the 360-degree air defense concept, weapons of destruction are employed in a manner appropriate to each attack. These weapons fall into two general categories.

(a) *Long-range weapons* are employed in the protection of any defended objective. They attack and destroy hostile forces which approach defended areas from any direction and as distant as possible from all potential objectives of the enemy and are characterized by their flexibility and mobility. Such destruction is accomplished most effectively by manned or unmanned long range interceptors. These weapons should incorporate recoverability where possible.

(b) *Short-range weapons* are employed in point defense and are generally restricted to the destruction of attackers approaching specific targets or a concentrated group of targets. These weapons are limited in range and normally are unrecoverable. Generally, mass application is characteristic of these weapons, regardless of the type guidance employed. These weapons are in the main gun or rocket ground-to-air ordnance. Their effectiveness is limited by the extent to which the enemy enters their range of fire and their capability for target acquisition.

b. *Deceptive Operations.* Noncombative means designed to mislead or confuse enemy forces are employed in deceptive operations and reduce the effects of enemy attacks by causing the attackers to make gross errors. Examples of deceptive operations are camouflage, decoys, smoke screens, artificial clouds, controlled lighting, radar reception and jamming, and control of electronic emissions. Implementation of deceptive operations is governed by appropriate directives applying to the coordination required between air defense forces and other agencies concerned. All of the means except camouflage and decoy depend upon adequate warning for their implementation.

c. *Preventive Operations.* Tasks designed specifically to reduce the susceptibility of communities and facilities to damage from air attack are preventive operations. These operations also facilitate the recuperation of such areas if attacked. When performed successfully, they minimize the effects of enemy air attack and thereby prevent the enemy from fully exploiting his capabilities.

(1) These operations include activities such as warning of impending air attack, control of work stoppages, use of shelters, use of dispersal, control of transportation and evacuation, control of fires, organization and control of medical aid facilities, disposal of unexploded bombs and missiles, and decontamination involving chemical, biological, or nuclear conditions. As in the case of deceptive operations, all of the preventive operations are facilitated by intelligence of enemy forces.

(2) Generally, the responsibility for initiating preventive operations rests with civilian authorities in areas under their direct control and with the appropriate military authorities in areas directly under military control. The coordination that must be effected between military and civil authorities in these operations is provided for in public law and other high-level directives.